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ABSTRACT

This brochure, part of a series about good practices in vocational training in the European Union, describes 12 projects that use distance learning to promote lifelong learning in adults. The projects and their countries of origin are as follows: (1) 3D Project, training in the use of IT tools for 3D simulation and animation and practical applications in architecture, industry, and graphics projects from Spain; (2) Multipalio, a European network of qualifications for teachers and trainers in open and distance learning from Italy; (3) Interfoc, Internet training of occasional trainers in businesses from France; (4) Electron, distance teaching and lifelong learning in the electronics sector with the development and use of updated tools for information networks from Greece; (5) AYTEM, support for young teachers on the training market via distance learning from Lithuania; (6) Multiformat Technical and Business English, an open and distance learning program from Finland; (7) a multimedia hypertext navigation system for distance learning from Ireland; (8) Material for open and distance learning in powder metallurgy at the European level; (9) Flexiform, the use of new technologies for flexible and distance continuous vocational training in environmental protection and forestry occupations in France; (10) university/industry cooperation in designing pilot self-training courses in the area of continuous training in engineering in Portugal; (11) distance courses in management control in Italy; and (12) Bayer International Management Simulation, business management self-training programs at the workplace and by distance learning in Germany. All project descriptions include contacts for more information. (MO)

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ED 480 329

Leonardo da Vinci

Series: Good Practices (4)

Distance learning

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European Commission

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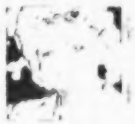
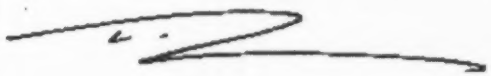


Knowledge and professional skills must be regularly updated if we are to address the new requirements of the economy and the labour market. Now, more than ever before, lifelong learning is essential for all. The Leonardo da Vinci programme, which has been the chief Community instrument in the field of vocational training since 1985, provides concrete responses to these new needs.

The results of the projects supported under this programme deserve to be more widely disseminated among the vocational training community, the social partners, and policy makers. Subsequently they must be adapted to other target groups, developed, used in other professional environments, and introduced into the national systems.

To this end the Education and Culture DG, which manages the Leonardo da Vinci programme, has prepared a series of brochures 'Leonardo da Vinci – Good Practices', to inform people about the results of the programme. These brochures are designed to familiarise as many people as possible with examples of good practices under the programme. The projects presented here have been selected for their impact and their originality. This selection represents only a small sample of what the programme has achieved between 1995 and 1999. It is with great pleasure that I present this brochure by the Education and Culture DG which, I hope, you will find interesting.



Viviane Reding
Member of the European Commission
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Distance learning

Knowledge and information have become the driving forces in our societies; training and skills development constitute a priority in this. On the other hand, the new information and communication technologies (NICTs) are essential as the preferred way to transmit knowledge and learning. Nowadays, people are looking for ways to learn "where, when and how" they want. And so the use of these new technologies will enable people to engage in lifelong learning, as the European Commission emphasised in 2001 [1]. The learning process will no longer end with school, but will start much earlier and carry on in the workplace and in private life.

E-learning, the new method of distance learning using NICTs, particularly the Internet, will radically change the way we work, live and learn by opening up access for everyone to information around the clock and from any location. The concept of distance learning, which predates that of e-learning, also fits in with the good training practices in the first phase of the Leonardo da Vinci programme. Multimedia tools, such as CD-ROMs, are currently used more in this connection than the Internet.

Learning activities outside traditional forms of education are more often known as "continuing training" or "lifelong education". Originally conceived as a kind of "second chance" for those who had been "excluded" from initial training, continuing training is aimed at the economic and social betterment of adults. In order to meet the needs of "adult learners" faced with the demands of their job, the projects presented in this brochure set out to make education and training more flexible in terms of the location, time, pace and content of courses.

Given the speed at which technology becomes obsolete, the products presented in this brochure focus on innovative concepts. Furthermore, the European education and training systems must be able to adapt to the needs of the knowledge-based society, by offering training products tailored to the needs of specific groups and workers who risk being left behind by the pace of change.

In what can still be regarded as a transitional period, the way these tools are used still varies very considerably. This phenomenon is clearly illustrated by the good Leonardo da Vinci practices presented in this brochure. Although the many training opportunities offered outside traditional education systems represent a significant reservoir of knowledge, the new technologies are no more than tools. Their benefits or drawbacks will depend on the use made of them. In brief, the new technologies should be used to support creative training and self-training, taking advantage of the three major aspects of open learning: temporal, spatial and methodological flexibility.

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(1)
European Commission (2001):
Making a European area of lifelong learning a reality,
COM (2001) 678 final,
http://www.europa.eu.int/comm/education/life/communication/com_en.pdf

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3DPROJ (3D Project)

Training in the use of IT tools for 3D simulation and animation and practical applications in architecture, industry and graphics projects (Spain, 1995)

The new technologies are revolutionising existing knowledge and qualifications. Simulation, 3D animation and virtual reality technologies are evolving, but very few professionals in Europe are able to use them properly. This is particularly the case in the areas of architecture, engineering and the audiovisual industry. The project coordinated by the IES [2] "La Guineueta" in Barcelona (Spain) identifies training needs in these new professions.

The aims of the project are to define the job description for a 3D project technician and to develop a training plan for this job. Corresponding training modules have been developed, some of which are also suitable for open and distance learning. From 1996 to 1999, the 3DPROJ pilot project team produced a job description for this profession and developed a training course lasting 2 000 hours over two years to train multi-skilled technicians to work in 3D modelling and animation in architecture, engineering and the audiovisual industry.

This project was developed in partnership with various training institutes and companies in Italy (Piedmont) and France (Midi-Pyrénées).On the basis of existing technologies and training needs in the three countries involved, the partners defined a standard profile of qualifications and created a corresponding training programme validated by all the partners. Specific training modules were evaluated by a feedback system which includes companies working in this sector. The products were developed in English, French, Italian and Spanish, and the CD-ROM and the Internet site are also available in these four languages.

A training programme has been developed and disseminated widely. The training modules use various learning tools. In addition to the courses for trainees, virtual learning tools were created, such as distance learning modules in the form of a virtual "teledebate", educational software (interactive CD-ROM for use on Internet navigators), the website, training evaluation methods, etc.

The partnership disseminated its results widely. The partners developed an interactive website including electronic forums, the results of the project, modules (on request by e-mail), and a database of training centres and companies working in the 3D area. Furthermore, contacts were made with CEDEFOP (European Centre for the Development of Vocational Training) with a view to including the results of the project in its interactive platform *European Training Village*.

The 3DPROJ product led to a new project for the wider dissemination and recognition of the results, Beyond 3DPROJ (2000–2001), the aims of which are to disseminate the results of 3DPROJ in the 3D sectors, to provide Europe-wide validation of the professional certificates and qualifications required and to adapt the initial 2 000-hour course to the specific features of the three sectors (architecture, engineering, the audiovisual industry) by dividing it into three specialist courses of 1 000 hours each.

The promoter is currently developing a European network of vocational training agents (centres, teachers and students) in the 3D area and the three sectors, based on the 3DPROJ server and the electronic magazine *3D-FORM*. From 2002 onwards, it should be possible for the course developed to be produced and approved as an advanced course in initial vocational training (1 800 hours in two years). Next year, the course will be offered as an e-learning tool entitled **edu365.com**. Another challenge for the international 3DPROJ team is to develop multimedia material suitable for use with open and distance learning (e-learning) for all the 3D courses.

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(2) Instituto de Educación Secundaria (Institute of Secondary Education)

Multipalio

European network of qualifications for teachers and trainers in the area of open and distance learning (Italy, 1997)

Open and distance learning is a strategic tool offering considerable potential for the development of innovation in training systems. It provides for the integration of new training material and the personalisation of training tools. It increases access to training and gives priority to the person being trained.

Transnational cooperation, based on the experience and expertise of the partners, is one of the key factors in the success of this project.

The training courses are divided into modules covering the following themes: system design, design and development of teaching material, student support, management of information systems on open and distance learning and evaluation of open and distance training. These modules operate in specific sectors of the information and open learning evaluation systems.

The objectives of Multipalio are to create an ongoing system for analysing the need for skills and to update and improve the range of training modules for trainers. The Multipalio activities and products, available on paper and electronically, cover the main themes and the necessary skills for planning and creating an open distance learning product.

It is intended for companies, public organisations, networks of SMEs, universities, colleges and vocational training establishments.

The modules are available in English, French, German, Italian and Spanish.

To create one's own training programme, one can consult the Multipalio Internet site or order the CD-ROM.

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Interfoc

Internet training of occasional trainers in businesses (France, 1997)

In most cases, one-off training in SMEs is conducted by employees who have not been specifically trained to be trainers. Interfoc's idea is to prepare occasional in-house trainers to take part in open, multimedia and distance training courses, thanks to a training tool available on the Internet and Intranet.

To this end, the partners developed a series of six modules focusing on:

- training systems and occasional trainers;
- preparing and running a training series;
- devising a learning pathway;
- guiding and supporting individual learners;
- guiding and supporting virtual groups;
- evaluation during and after the training.

An adult education approach will be adopted.

Interactivity and the freedom to navigate between modules and sequences within each module are emphasised as far as possible. The screens present written and illustrated content in an attractive way.

Advice is offered to occasional trainers in a special unit on course preparation, and a personal log is available for them to record their progress. A glossary is also included, together with an e-mail service for the tutor to support the occasional trainer if need be.

These modules, available in seven languages (Czech, English, French, German, Greek, Italian and Spanish), can be used on the Internet.

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Electron

Distance teaching and lifelong learning in the electronics sector with the development and use of updated tools for information networks (Greece, 1998)

Electronic communication networks and Internet services (including distance learning) offer great potential for lifelong education and learning. Electron has developed databases and open and distance learning material for training in the electronics sector, based on the use of new technologies (CD-ROM, videoconferencing, Internet).

The partnership designed and created an electronic environment based on the use of teleconferencing via the Internet, including e-mail, voice and video transmission. It offers learning programmes in electronics for electricians in industry and students.

It also created a network of electronics researchers, technicians and practitioners.

Having analysed the training needs in the sector in the participating countries and set the parameters for the project (educational material, architecture of the database, etc.), the partnership planned the development of this database and the teaching material: adaptation to an IT environment, evaluation and production of the final product and dissemination of the final results.

All the products were tested by the partners at European level and by scientists in the sector (electricians and students). All the partners were involved in analysing training needs and disseminating the final results in their various countries. Videoconferencing sessions were organised, and training seminars took place in Cyprus, Greece and Sweden for professionals and young job-seekers in the sector.

Thanks to the quality of the end products, the partnership was able to boost lifelong learning in the electronics sector, promote open and distance learning and create a training network involving scientists and others working in this area.

The Electron project promotes the use of the e-learning environment in Europe, encouraging the acquisition of knowledge on e-learning techniques simply by using the project's own site, and also allowing users to follow seminars on-line via the project's on-line services. In this way, users of the Electron project can acquire both theoretical and practical knowledge by learning the basic principles of distance learning and verifying them at the same time in their own learning process.

Another innovative feature of the project was the creation, from the website, of a communication network in the electronics field. Using this network, students can exchange knowledge, know-how, experience and innovative ideas, thus creating a real community of experts in the electronics sector. The educational material, comprising four training modules, was created in a hard-copy and a CD-ROM version.

It was distributed to teaching and training establishments in the participating countries (Cyprus, Greece, Norway, Sweden).

In order to make it easier for practising and student electricians to communicate, videoconferences on the Internet and virtual classes were organised. Finally, a website at http://imm.demokritos.gr/electron/ was created to present the objectives and results. This site was the main channel for disseminating the project.

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AYTEM

Support for young teachers on the training market via distance learning (Lithuania, 1998)

It is difficult for young teachers with innovative ideas to introduce changes at their workplace, given that education systems tend to be traditional and centralised. This distance learning project was designed to help young teachers to develop skills that will help them to access the education market more easily in the context of educational reform. The introduction of distance learning and information technologies is an innovative aspect for partners in eastern Europe.

The project has created a continuous distance learning course on CD-ROM entitled "Facing up to change in the context of educational reform". The aim is to improve the skills of teachers and help them to respond to current and future reforms.

AYTEM has also promoted links between various institutions affected by changes in education, including the universities and regional teaching centres, both at national level (above all in Lithuania) and at European level.

The work programme involved developing a methodology, content and distance learning material for the in-service training of teachers, and testing and disseminating this product.

To achieve these aims, the partnership developed training modules on teaching in a new framework (new educational concepts, new methodologies, new educational environments to be created, etc.). The following three products were created: a distance learning curriculum, a *teachers' manual* and the multimedia CD-ROM mentioned above containing a full range of material: "lessons" describing the new educational concepts and methods and ways of organising a new environment for education, in particular by means of the web.

There was effective transnational cooperation between the participating countries (Denmark, Finland, Hungary, Lithuania, Poland and Sweden).

The project was disseminated widely. It was presented in a publicity leaflet written in English and Lithuanian and distributed at many fairs and conferences, at seminars and other events where the project was represented, as well as on the Internet.

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MTBE (Multiformat Technical and Business English)

Technical and business English open and distance learning programme (Finland, 1995)

Mastering foreign languages is one of the skills needed to access the European labour market. This project therefore seeks to improve English and communication skills. Its aim is to develop a model for the open and distance learning of languages, incorporating the use of telematics services.

MTBE has developed a new approach to language learning and study using telematics services. It has developed a corpus of material for learning English designed for commercial and technical employees, and telematics services for supporting the production of language learning materials and facilitating student-teacher communication.

MTBE started by analysing the training needs in four Member States (Finland, France, Ireland and UK). Language training programmes and tools were developed from the results obtained and evaluated by pilot groups.

Telecommunications are used to create innovative training tools and to teach pilot groups. In parallel, training tools in the use of telecommunications are being created for trainers.

The products comprise language learning material such as manuals, CD-ROMs and a guide for trainers including elements relating to telematics culture.

An Internet site at http://www.sonera.fi/mtbe/ was created to disseminate the project, and many conferences were organised to present it (in Belgium, Finland, Hungary and the UK). Brochures were produced, and the promoter chose sectoral (technical and business) organisations as the target groups. The project is a good example of foreign language learning, thanks not only to the quality of its content and teaching approach but also thanks to the use of new technologies and its excellent management.

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Multimedia hypertext navigation system

Multimedia hypertext navigation system for distance learning (Ireland, 1996)

The United States is still ahead of Europe when it comes to distance learning. The number of universities and colleges in the USA offering courses or training on Internet sites is growing rapidly. This technology permits users to access huge databases and promotes distance learning. Europe does not yet have the infrastructure to offer this type of training on the Internet on a large scale. The aim of the project is to provide training organisations with a user-friendly system for introducing new or existing training courses on the Internet.

The new training system has developed in stages and can be modified to match changes in demand. It has a technical structure designed to exploit all the possibilities of the Internet and offers an in-depth analysis of the theory and practice of distance learning as a basis for teaching strategies.

More specific objectives of the project included producing 12 independent sub-systems under the central platform, developing course content to be used in the system and finally establishing certificates for students completing the training.

These products provide European training organisations with access to an innovative training system which can be disseminated to a larger number of students via the Internet.

The multimedia hypertext navigation system provides information on text formats, audio media, animated images, videos, audio-conferences and graphics. It covers a variety of activities: the submission of homework, correction and follow-up of homework, student records, e-mail and conferences. The distance learning web navigation system is used for developing courses and then teaching them to students. The learning sub-sections of the system can be consulted on the Internet, and the website http://www.nki.no/eeileo/ is available in English, Italian and Norwegian.

The Internet was also used for publishing and disseminating the project.

Analyses and experience of using this new training tool were published on the website, and a system to facilitate web-based training was created, with specimen courses.

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Learning in metallurgy

Material for open and distance learning in powder metallurgy at European level (1997)

Powder metallurgy is a key industrial activity for an extremely wide range of industrial applications, such as car manufacture. Scientific and technical research into developing state-of-the-art applications of these products is currently booming. There is also a growing demand for training, access to teaching and materials from those working in the sector who want to keep up with these developments.

This project has created and disseminated a range of standard material, divided into modules, for open and distance learning. Its main target group is those working in the sector.

A two-year project, coordinated by the EPMA [3], its aims are to:

- produce learning material on powder metallurgy;
- ensure that the products are compatible and can be used throughout Europe;
- grasp the opportunity offered by new technologies for distance learning and training.

A range of scientific and technological material has been created, evaluated and approved by a multinational group of universities and companies that preferred to use traditional methods and media. In numerous meetings and workshops in five countries (Austria, Belgium, France, Germany, Spain), the partners assembled a large amount of information that they were able to disseminate, partly via video-conferences.

Initially, the information was disseminated on the EPMA website, visited by more than two million people per year, and via seminars and conferences organised by the EPMA.

The product focuses more on learning than on teaching. It can be adapted in terms of language and culture and used in both SMEs and large companies.

It is sold in CD-ROM form as "*Powder metallurgy: materials, processes, applications*". Several hundred copies have already been sold, and sales are still growing.

The product was presented during a series of video-conferences on specific aspects of powder metallurgy adapted for distribution. The videoconferencing material has not yet achieved the success it deserves, because of the slow development of the Internet-based videoconferencing industry, but faster penetration of high-speed Internet technology is expected.

With regard to the future, EPMA intends to use the material produced so far to draw up *information guides* specifically for designers and users of powder metallurgy, to be published on the website, as well as on a second CD-ROM. The series of courses/conferences will form the basis for distance training of students from the participating universities around Europe.

The project is very innovative in the sense that it has helped to improve methods for the acquisition of information on powder metallurgy, whilst contributing to better understanding of the learning process. It will also offer trainers a vocational qualification in powder metallurgy. The project has made an important contribution to developing and protecting the powder metallurgy sector for the long term at a time when competition from outside the EU is increasing.

The material on the CD and a wealth of information can be found on the EPMA website: http://www.epma.com.

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(3) EPMA - European Powder Metallurgy Association

Flexiform

The use of new technologies for flexible and distance continuous vocational training in environmental protection and forestry occupations (France, 1996)

The forestry sector comprises mainly self-employed people who often have no scope for delegating their work and therefore cannot access continuing vocational education. Flexiform offers a solution in the form of a distance learning system. Training is vital in order to make the industry more competitive and diverse, whilst increasing employment.

The Flexiform programme offers a practical answer to the problem of access to continuing training for forestry firms. The basic idea is to provide the managers of such firms with flexible distance training tools that can be used during quiet periods. The training product comprises three CD-ROMs covering forestry management, the exploitation of woodland and watercourse management.

The project included a transnational analysis of the training needs of those working in the sector, including training managers, which led to the establishment of modular, flexible distance learning tools. The content and methodology take account of the particular constraints of work in this sector.

The design of the CD-ROMs allows users (managers, employees) to measure and update their knowledge. The product was also designed as a training tool for initial training institutions in the forestry sector. Navigation on the CD-ROMs is intuitive, and the user has access to hypertext links leading to illustrations and definitions (a dictionary of technical terms is included in the software). A questionnaire allows users to evaluate their level of knowledge (positioning test), so that the learning experience can be individualised. The product also helps users to carry out self-assessment before starting a training activity.

Coordinated by the Chamber of Industry and Commerce of Valence and Drôme (France), the project was carried out in collaboration with the Spanish Training and Employment Centre in Coria, in the Extremadura region, and the Portuguese Centre for the promotion of entrepreneurship Beira Aguieira in Mortágua, in the region of Viseu. The main target groups are professional organisations and international partnership networks. Moreover, each partner has a website (http://www.drome.cci.fr, http://www.nymphea.org, http://www.coria.org/pfe). Another plan is to develop downloading sites giving Internet users access to slide shows explaining the project.

This project meets the needs of forestry firms seeking innovative training solutions using the new communication and information technologies.

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Pilot self-training courses in the area of continuing training in engineering

University/industry cooperation in designing pilot self-training courses in the area of continuing training in engineering (Portugal, 1996)

The aim of this project is to promote the continuing training of technicians and engineers. For this target group, it develops training products to be disseminated on the Internet and organises training activities using virtual classes in three European countries (Portugal, Sweden and the UK).

The need for lifelong learning and the problems of training access and quality assurance are becoming ever more critical.

The main goal of this project is to create learning material based on four concepts (accreditation, standard value, certification and qualification). Validity depends on whether the institution is or is not authorised to issue a vocational qualification and on the national laws of the country in question.

Five products were developed and published on the Internet to demonstrate that it is possible to create and use high-level material (after appropriate instruction) for training high-level technicians.

The products are:

- Self-training on the web for electrical engineers 1998–1999;
- EMC (Electromagnetic Compatibility), an ever-present concern;
- PMSM (Permanent Magnet Synchronous Motors) drive;
- New Trends in EBSE (Electronic-Based System Engineering);
- OFC (Optical Fibre Communications).

The products/courses can be consulted on the website http://webnt.ist.utl.pt/.

The partners formed several working groups for development and dissemination. The first was responsible for project management and overall development of the work (defining objectives, planning and the budget). The second was responsible for monitoring the project, evaluation and dissemination. The third was responsible for developing the project, assuring the quality of the results and the content. The fourth was responsible for accreditation and certification. The fifth and last group was responsible for organising training in the various countries.

Dissemination was a task shared by all the partners. The brochures presenting the five products/courses and the virtual classes were published in English.

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Distance courses in management control

Distance courses in management control (Italy, 1998)

The electricity market is being increasingly liberalised throughout Europe. Employees need to demonstrate flexibility in their working methods and update their skills continuously. The aim of this project is to meet the need for management training by designing a distance learning course on management control.

The project started by analysing the skills demanded by current organisational developments and went on to design and develop an open and distance learning course in management control.

The promoter designed and produced a course on the Internet which could be adapted to the needs of individual users. It addresses technical and organisational issues as well as behavioural skills.

The support tools, published on CD-ROM, include case studies, games and simulations, databases, check lists, etc. The package offers on-line support by a training consultancy and, off-line, a programme of small-scale workshops and workgroups run by a trainer.

The methodological results comprise evaluation of the training on the Internet, a distance learning model and an innovative model for the organisation of intensive courses.

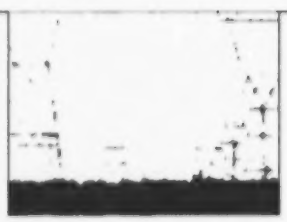
Training software on management control was created, with training evaluation tools and simulations/case studies.

The project yielded a bilingual (Italian/French) computer/web-assisted course on management control for middle managers who need to acquire new skills in this area.

The CD-ROM comprises

- a course for distance tutors (content, methods and tools);
- methods and tools for monitoring and evaluating the performance of participants, the teaching methodology and the achievement of the pre-set goals;
- specification of "good practice" in the design, development and distribution of distance learning and the process of engaging and motivating participants in a virtual learning environment.

The project has helped many middle and senior managers to access appropriate training, thus making their companies more competitive.



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self-training at the workplace

Business management self-training programmes at the workplace and by distance learning (BIMS - Bayer International Management Simulation) (Germany, 1996)

Developments in international markets, changes in businesses' work organisation and growing demands as regards quality management and competitiveness mean that workers in companies of all sizes have to keep on updating their skills and qualifications.

The partners in this project sought to promote continuing self-training at the workplaceby producing training programmes on business management and a distance learning case study.

The goal was to create training programmes in business management, having regard to the European directive on annual accounts, and optimisation of production phases, with quality management to the ISO 9000 standard.

The project achieved its objectives of creating training programmes in three languages (English, German and Spanish) on:

- cost accounting (on CD-ROM);
- knowledge of the various work processes (on diskette);
- business management (hard-copy guide);
- drawing up balance sheets (on CD-ROM);
- balance sheet and income accounting (on CD-ROM);
- production planning and quality assurance (on CD-ROM), and
- a Windows based management system for a virtual training case (simulation) in German (BIMS).

These programmes were tested by 987 young people in the partner countries (Belgium, Spain, United Kingdom); workshops were held as an introduction.

The training programmes are trilingual and multimedia-based. A distance learning case study is also used to exploit the knowledge gained via the training programmes. This study requires the regular presence of tutors and allows the creation of on-line links between different training teams in various countries in order to exchange information and experiences.

The composition of the training groups in the partner countries reinforces inter-disciplinary skills and ability to work in a team. The case study explains the management processes and helps with cross-disciplinary thinking and understanding of complex processes.

While updating knowledge of management methods and encouraging team-working, the programmes take account of the organisation's current skills requirements.

By including quality management, the project also encourages both self-training supported by the new communication technologies and the use of multimedia training products.

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A great deal of additional information on the European Union is available on the Internet.
It can be accessed through the Europa server (http://europa.eu.int).

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